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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/646,551 | 08/21/2003 | Zhibo Zhao | DP-308065 | 9433 |

7590 08/10/2005

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EXAMINER

NGUYEN, DINH Q

ART UNIT PAPER NUMBER

3752

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|-----------------------------|--|
| Office Action Summary | Application No. 10/646,551 | Applicant(s) ZHAO ET AL. | |
| | Examiner Dinh Q. Nguyen | Art Unit 3752 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 1-16 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>105, 5104, 264</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 17-20 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/25/05.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al (U.S. Patent No. 6,139,913) or Popoola et al (U.S. Patent No. 6,464,933).

With respect to claims 1-3, 5-7, Van Steenkiste et al or Popoola et al. teaches all the limitations of the claims except for gas flow holes of 10-25 millimeters length, the ratio of the hydraulic diameter to the length is 1:5 to 1:50, or the ratio of the collimator cross sectional area to the cross sectional area of the mixing chamber is 0.5:1 to 0.9:1. At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to configure the device of Van Steenkiste et al or Popoola et al with gas flow holes of 10-25 millimeters length, or the ratio of the hydraulic diameter to the length is 1:5 to 1:50, or the ratio of the collimator cross sectional area to the cross sectional area of the mixing chamber is 0.5:1 to 0.9:1, because Applicant has not disclosed that to have the gas flow holes of 10-25 millimeters

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length, or the ratio of the hydraulic diameter to the length is 1:5 to 1:50, or the ratio of the collimator cross sectional area to the cross sectional area of the mixing chamber is 0.5:1 to 0.9:1 provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either Van Steenkiste et al or Popoola et al configurations or the claimed configuration, because they both perform the same function of kinetic spraying. Therefore, it would have been an obvious matter of design choice to modify the Van Steenkiste et al or Popoola et al device to obtain the invention as specified in claims 1-3, 5-7.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al or Popoola et al as applied to claims 1-3, 5-10 above, and further in view of Mochida.

Van Steenkiste et al or Popoola et al teaches all the limitations of the claims except for hexagonal shape gas flow holes. However, Mochida discloses gas flow holes of hexagonal shape (figure 3B). Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Van Steenkiste et al or Popoola et al with hexagonal shape gas flow holes as suggested by Mochida. Doing so would provide an effective gas flow device.

5. Claim 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Steenkiste et al or Popoola et al as applied to claims 1-3, 5-10 above, and further in view of Belashchenko et al.

Van Steenkiste et al or Popoola et al teaches all the limitations of the claims except for an injector tube extending through the throat. However, Belashchenko et al discloses a spraying system with an injector tube 68 that extending to the throat. Therefore, it would have been obvious to one having ordinary skill in the art to have provided the device of Van Steenkiste et al or Popoola et al with the injector tube extending through the throat as suggested by Belashchenko. Doing so would provide a way to introduce material into a high velocity flow stream of gas (see column 11, lines 34-55).

With respect to claims 12-16, at the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide different configurations or location of the injector tube, or with different flow rate for the injector tube.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. 6,502,767 to Kay et al is cited to show a kinetic spraying system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dinh Q. Nguyen whose telephone number is 571-272-4907. The examiner can normally be reached on Monday-Thursday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Scherbel can be reached on 571-272-4919. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Dinh Q. Nguyen', with a long horizontal flourish extending to the right.

Dinh Q. Nguyen
Primary Examiner
Art Unit 3752

dqn